

PHARMACEUTICAL INORGANIC CHEMISTRY- BP104T

UNIT: 3 (GASTROINTESTINAL AGENTS)

CLASS: 7

TOPIC: ANTI-MICROBIAL AGENTS: MECHANISM & CLASSIFICATION OF ANTI-MICROBIAL AGENTS

Anti-microbial agents are used to destroy or kill the micro organisms or inhibit the growth of the micro organisms.

They are of six types:

1. Antiseptics
2. Disinfectants
3. Germicides
4. Bacteriostatic
5. Sanitizers
6. Sterilization

1. **Antiseptics:** These are the agents who prevent sepsis by destroying or inhibiting the growth of the micro organisms on the living tissues. Antiseptics can also be used in prevention to the hands of surgeons, dentists, nurses and others during their procedures.
2. **Disinfectants:** These are the substances which prevent infection by the destruction of pathogenic micro organisms and are generally employed for inanimate objects and materials such as instruments, hospitals, rooms, equipments etc. to get rid of micro organisms.
3. **Germicides:** These are the substances which kill the micro organisms; the more specific term used is bactericide, fungicide, amoebicide and virucide.
4. **Sanitizers:** These are the disinfectants used to maintain public health standards and are called sanitizers. It is mainly concerned with cleaning or washing away the micro organism.
5. **Bacteriostatic agents:** These are the substance which can inhibit the growth of the bacteria but does not kill the bacteria.
6. **Sterilization:** It is the process of complete destruction of all the micro organisms including bacterial spores. I can be done by Heating or by using chemical agents.

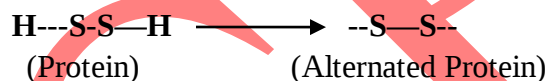
MECHANISM OF ACTION:

Inorganic compounds exhibit their action by:

1. Oxidation
2. Halogenations
3. Protein precipitation

1. Oxidation: Reducing group is present in most of the proteins and these groups are required for the growth and survival of the micro organisms. These reducing groups are oxidized by oxidizing agents which alter the shape and confirmation of the proteins and thereby alter its function leading to protein destruction.

Example: Non-metal anions, peroxides, metal peroxides, permanganates, halogens act by this mechanism.



2. Halogenation: Most of the enzymes are proteins in nature. Primary and secondary amine group present in protein peptide linkage undergo chlorination with change in molecular shape and ultimately leading to the destruction of proteins. Generally Hypochlorites act by this mechanism.

Examples: Povidone Iodine solution, Potassium Iodide

3. Protein precipitation or protein binding: Astringents are the compounds which bring about protein precipitation and form a protective layer on the surface and hence stop bleeding by constricting the blood vessels. Transition metal cations have protein precipitation action and if a very dilute solutions of such metal cation is used over a tissue, a mere surface action leading to shrinkage of the skin takes place and is called astringent action. The metal forms complex with various polar groups present. So, thin complexation of functional groups at action site of protein causes drastic changes in properties of protein.

Example: Boric acid, borax, silver nitrate, mercuric oxide, antimony sodium tartarate.

2 MARKS QUESTIONS

1. What are anti-microbial agents
2. What are the types of mechanism of action of anti-microbial agents

5 MARKS QUESTIONS

1. Write in detail about the mechanism of action of anti-microbial agents

10 MARKS QUESTIONS

1. Define anti-microbial agents and classify with suitable examples? Write in detail about mechanism of action of anti-microbial agents

RAGHU